

STREAM CROSSING EXPEDIENTS

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MARINE CORPS SCHOOLS
MARINE BARRACKS, QUANTICO, VIRGINIA

This pamphlet presents a complete course of instruction in Stream Crossing Expedients as conducted at the Officer Candidates' School, Marine Corps Schools, Quantico, Virginia. It includes the physical organization and arrangement of the instructions, hour by hour, as well as the scope of the subject to be taught in each period, the text references, locale, equipment required and the actual lectures or instruction given.

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SECTION 1

1. Outline.—

TYPE OF INSTRUCTION: Field Exercise.

PLACE: Engineer Demonstration Area
(1331.48-1342.17).

MAP: Aerial Mosaic of USMC Reservation, Quantico, Virginia.

LENGTH OF PERIOD: Four (4) hours.

UNIT: Demonstration troops, ten (10) men.

EQUIPMENT: Microphone and public address system
2 Rifles, M1
2 Carbines, M-1 w/launcher, M-8
2 BAR's, M-1918A2
1 BMG w/tripod and spare parts
1 37mm Gun, AT
8 Chests, ammunition, BMG
2 Field Transport Packs, complete
2 Helmets, steel
4 Truck bows, $\frac{3}{4}$ ton
7 Canvas truck covers, $\frac{3}{4}$ ton
2 Canvas truck covers, $\frac{1}{4}$ ton
2 Canvas truck covers, $1\frac{1}{2}$ ton
1 Canvas truck cover, $2\frac{1}{2}$ ton
4 lines, $\frac{3}{4}$ inch, 100 ft.
1 line, $\frac{3}{8}$ inch, 50 lb. reel
1 Truck, $\frac{1}{4}$ ton, (jeep)

PURPOSE: To show the individual Marine practical methods of floating equipment found in an infantry battalion.

CONDUCT OF EXERCISE: The troops who are to see the demonstration, form a large semicircle around the area in which the demonstration is to be held (care must be taken so that all can see the instructor and the demonstration).

(1) Orientation on Stream Crossings is given by the instructor.

(2) The instructor calls for two men from the demonstration troops equipped with rifles, steel helmets, and field transport packs. They make up the riflemen's equipment shelter half float using crossed rifles, BAR's and sticks, demonstrating the floats in the water as they are made up.

(3) The same two men from the demonstration troops make up the riflemen's equipment poncho float with marching packs, using crossed rifles, carbines, BAR's and sticks. As the floats are made they are displayed in the water.

(4) The same two men make up the poncho float and demonstrate its use in the water.

(5) Six men, representing a machine-gun squad, are called forward from the demonstration troops. They construct the truck bow squad raft, stow their equipment and paddle across the stream. These men are then dismissed.

(6) Four men from the demonstration troops are called forward by the instructor. They demonstrate how to construct and secure a bundle of brush. This bundle, with another previously prepared one, is then properly wrapped and secured in canvas. The four men pole or paddle across on the brush float demonstrating its use as a personnel float.

(7) Five men, representing a 37mm antitank squad, are then called forward by the instructor. They push three previously prepared brush floats into the stream and launch the 37mm

gun on the floats, securing a holdback line and a tow line and pull the gun across the stream. Four men are dismissed to secure the 37mm gun.

(8) Six men launch the $\frac{1}{4}$ ton truck on four brush rafts, secure the holdback and tow lines. The other four men of the demonstration troops tow the truck across.

(9) All ten men of the demonstration group now are used to make the brush raft footbridge. They push the prepared brush floats into the stream and carry to the stream bank the prepared sections of the footbridge. These men then construct the footbridge across the stream. When completed, the instructor then has some of the observing troops walk and double time across the bridge.

2. General.—a. The Marine Corps Infantry Battalion is not issued standard stream crossing equipment and must, when necessary, devise methods to cross streams. The Engineers have the equipment to set up crossings, but seldom will they be available for small unit crossings of streams. Therefore, an Infantry Battalion must learn how to cross personnel and weapons using the regular equipment available to them in the locality of the operation.

b. All the initial training of troops using expedients for stream crossings should be conducted in streams with a rate of flow of less than two miles per hour. Operations on streams with a stronger current are difficult for an inexperienced unit and are dangerous to both personnel and equipment.

c. The methods described in this pamphlet should not restrict the training of the unit. Units should be encouraged to develop other methods for stream crossings. This field is unlimited and subject only to the ingenuity of individuals in the training group.

SECTION 2

PERSONNEL AND EQUIPMENT FLOATS

3. **Riflemen's Equipment Shelter-half Float.**—a. Two men place their shelter-halves, one on top of the other, on the ground. The triangular flaps are folded in from each end from the seams of the shelter half. The packs of the men are then placed in the center of the shelter halves with the long axis of the packs parallel to the long axis of the shelter halves. The packs can then be secured together by the cartridge belts of the two men. The rifles, with the bayonet and scabbard attached, are then placed on top of the packs, crossed to give rigidity to the bundle, and secured at the point of crossing by the web trouser belts of the men. (See Figure 1). The diagonally opposite corners of the canvas are then lashed to the

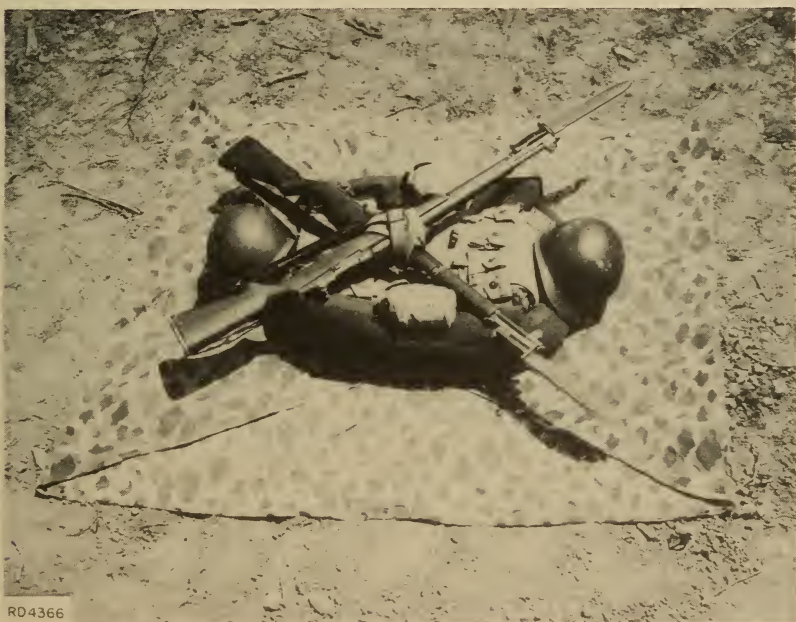


Figure 1.—Field transport packs and equipment properly stowed before wrapping the shelter half float.

opposite ends of each rifle by use of the shelter tent ropes. (See figure 2). The men then strip off their clothing, fold it, and place it inside the float. (See figure 3). The float has eight to ten inches of freeboard and may be pushed across a stream by a swimmer. (See figure 4). This type raft can safely remain in the water up to one hour and will carry three hundred pounds. This float may be constructed with one shelter half as a base, the other shelter half being tucked around the gear in the completed float to keep it dry in case water is shipped.



Figure 2.—Completed shelter half float less clothing.



Figure 3.—Completed shelter half float with clothing stowed.



Figure 4.—Shelter half float made up with but one shelter half as a base; the other shelter half is used to cover the gear.

b. Personnel not armed with the rifle, or personnel desiring to keep their rifles in readiness, can make this type raft by using two poles each equal to the length of the rifle with bayonet attached, in place of rifles. The BAR man can make this float with the assistant BAR man who may be armed with a carbine. The bipod legs of the BAR are extended horizontally as an extension of the barrel. The assistant BAR man cuts a

stick which is equal to the length of the BAR plus bipod, and lashes it to his carbine. The BAR is crossed with the stick tied to the carbine to make up the float in a similar manner to the one previously described. If two men are armed with carbines and wish to make up a shelter half float, they should use sticks that are rifle plus bayonet length. A raft made with poles can be used to float a caliber .30 heavy machine gun.

c. A line may be stretched across the stream, and men may utilize this as a safety line to support themselves. In addition, non-swimmers have security by holding on to the line with one hand and pushing the float with the other. This line is a necessity in a swift moving stream.

4. Riflemen's Equipment Poncho Float.—a. Often men will be carrying the marching pack and will not have a shelter half with which to construct a float. We then utilize the poncho in constructing a float. One poncho is folded double with the neck opening at the center of the single edged fold. (See figure 5). After securing the packs in the center of the poncho, the rifles (without bayonets attached) are laid across the packs, crossed, and lashed together at the point of crossing. The men, working on opposite ends of one of the rifles, reach down between the two butts and two muzzles, grasp the diagonally opposite corners of the poncho and fold them over both ends of one of the rifles. The corners of the poncho are folded sufficiently enough around the ends of the rifle to insure a secure purchase by the line or cordage used to tie them. (See figure 6). The two men then move to the other rifle and repeat the above procedure, making sure the ends are brought up taut to provide plenty of freeboard. The other poncho can be used to cover the gear to keep it dry in case any water is shipped. (See figure 7).



Figure 5.—Equipment used to make the poncho equipment float.



Figure 6.—Completed poncho equipment float with the clothing stowed.

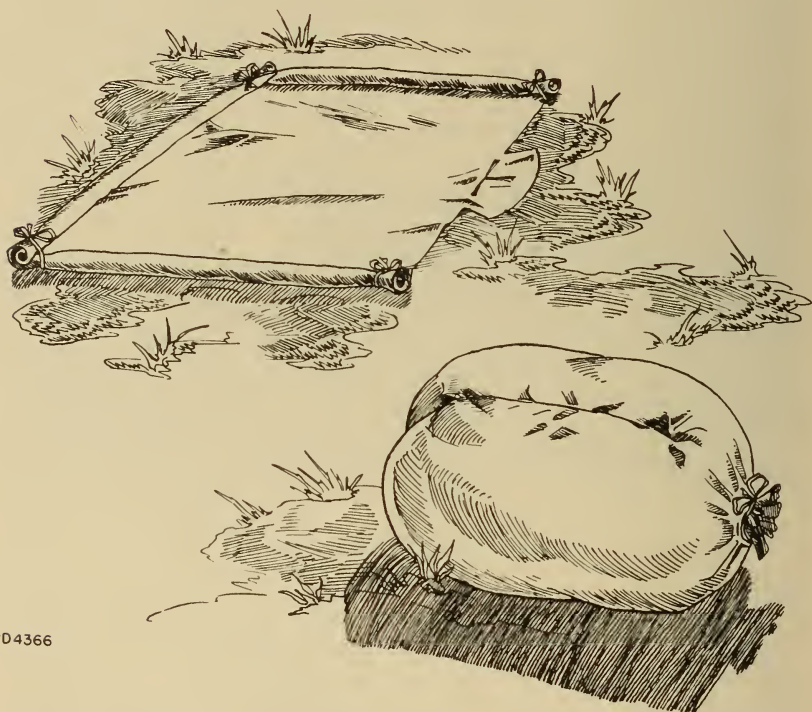


Figure 7.—Poncho equipment float being towed.

b. This type float can also be constructed using two sticks of rifle length, two BAR's with bipod legs folded under, one BAR and a BAR length stick with Carbine, or two Carbines with Grenade launchers attached.

5. a. **Poncho Float.**—Another type poncho float, recently introduced in the Marine Corps, is similar in appearance to a large paper bag and is used as a float for individual crossings.

The poncho is laid flat and is then folded over once to form a rectangle, with the neck opening at the center of the single edged side. Starting at either corner that is formed by the junction of the single and double edges, a three inch fold is made in the double edged side and is held in place by the left hand; another double edged fold is then folded back over the first fold in an accordion pleat manner. Continue this folding until all three of the double edged sides are completely folded and are held in place by the left hand. A legging-lace or shoe lace is then securely tied in position three inches below the edges of the folds. The poncho is now turned inside out by reaching through the neck opening. The poncho is then immersed in water to wet the fabric. The poncho has assumed the shape of a bag. The neck opening is held closed by both hands, and then is inflated orally in the same manner as one would inflate a paper bag. The neck opening is then securely tied with a lace and is ready for use. (See figure 8).



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Figure 8.—Poncho Balloon Float.

6. **Truck Bow Squad Raft.**—a. Machine-gun squads and mortar squads must have some method of getting themselves their weapons, ammunition, and equipment across streams. An excellent means of doing this is by using the squad equipment float, constructed from truck bows. To construct this float, take four bows from a $\frac{3}{4}$ -ton truck and lash them together in pairs to form two squares. (Any size truck bow may be used as long as you have the canvas cover from a truck of similar size.) Place one of the square frames in the center of the canvas. Use empty ammunition chests, bed rolls, packs, etc., as a spreader and place the other frame on top of the spreader. (See figure 9). The spreader may be secured to the frames to give rigidity to the float. Throw the canvas loosely into the center. Be careful not to have any sharp corners in the canvas, since leaks occur whenever a sharp crease is made. (See figure 10). The canvas can be secured loosely across or to the bows. The depth of the raft depends upon the height of the spreaders used. The bottom of the raft may be covered with brush to even the pressure of the load. If truck bows are not available, but the canvas is, make two frames of saplings similar to the truck bow squares.

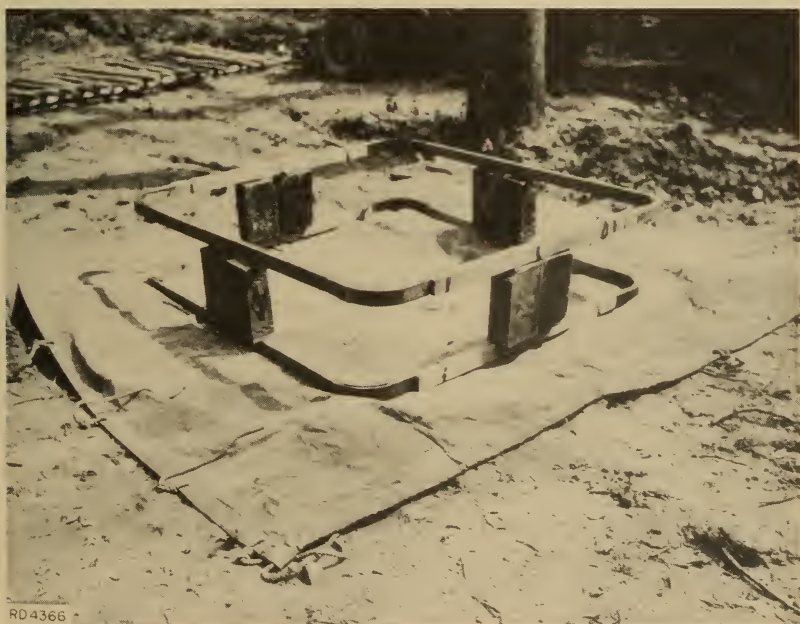


Figure 9.—Truck bow square frames set on canvas. Machine gun chests are used as spacers.



Figure 10.—Truck bow squad equipment float.

b. A raft of this type can support up to 1500 pounds, and can safely be left in the water three to four hours. It can carry a machine-gun squad, mortar squad, two to three casualties, 1000 pounds of ammunition, stores, or medical supplies, etc. This raft can be pushed across by swimmers, towed, or paddled across. (See figure 11).



Figure 11.—Truck bow squad equipment float with personnel.

7. Brush Rafts.—a. Brush rafts are simple to construct and are excellent all purpose floats. They can be used to float 37mm or 75mm weapons, $\frac{1}{2}$ to $\frac{3}{4}$ ton vehicles, two to three people, 300-400 pounds of ammunition, used as floats for foot-bridges, etc. In constructing a brush raft, spread a canvas (usually a $\frac{3}{4}$ ton or $1\frac{1}{2}$ ton truck cover) on the ground with the buckle side down. Build brush bundles of such a size that, when they are placed on the canvas, the canvas will extend 18 to 20 inches beyond the bundles on all four sides. Several small bundles are easier to handle than one large one, so make the bundles the full length of the area to be filled, but only about two feet wide and sixteen inches high. Two brush bundles in a float make the float more stable and it is harder to roll over in the water. (See figures 12 and 13). It takes three men about an hour to cut brush, bind it, and to make one brush raft float. These brush rafts are about 7 feet long and 3 feet wide and will support up to 800 pounds.



Figure 12.—Two brush bundles laid in canvas cover.



Figure 13.—Brush float made up of two bundles.

b. To construct a brush bundle, drive stakes in the ground to outline the size of the bundle desired. Lay pieces of line or telephone wire four to five feet long across the area formed so they will already be underneath when the brush bundle is to be secured. Brush, either dry or green, is then piled in between the stakes. Bind the brush with the line or wire previously put in place. (See figure 14). Remove the bundle from between the stakes and cut the ends off square with a machete or other sharp cutting tool. Make enough bundles to fill the desired area and place the completed bundles in the canvas. Raise the sides of the canvas and tie them securely in place with the lines on the canvas. The walls of the canvas should be as nearly vertical as possible so there will be less chance of shipping any water.



Figure 14.—Brush bundle, partially constructed, piled between stakes.

c. Brush rafts constructed with canvases in good condition can be used continuously for five or six hours before they become waterlogged or unsuitable for further use. The canvas must then be dried before it is again ready for use.

d. Brush rafts can also be constructed using loose brush. Spread the canvas out on the ground. Pile brush in the center of the canvas that is to be wrapped around the brush. Care must be taken to see that the brush is packed tightly along the sides and across the ends of the brush bundles so that the sidewalls of the canvas will be as nearly vertical as possible.

e. If you have a large canvas, construct three or four brush bundles to fit it, and construct a brush float. This type of float will carry six to eight men across a stream.

SECTION 3

FLOATATION OF VEHICLES AND WEAPONS

In this section, various means of floating weapons and vehicles are described. Gently sloping banks for floatation of heavy equipment should be selected. Log or sandbag ramps can be used to supplement sloping banks.

8. Floating the 37mm Gun.—Construct three brush rafts in the manner described in Section 1. Spot these rafts in line at the water's edge. Back the gun into the water and place the spades on the center raft. The weight of the trail will hold the spades secure in the raft. Place a pole beneath the recoil cylinder of the gun and rest it in the center of the other two brush rafts. If you cannot secure one pole strong enough to support the gun, two lighter poles can be used. Nothing has to be secured, as the weight of the gun will hold the poles in place under the recoil cylinder and on the brush rafts. Attach a towline to the trail spades and holdback line to the spade of the weapon. (See figure 15). The gun can be pulled across the stream, trail first, and beached. Holdback lines are attached to the weapon so that the raft can be kept under control while it is towed across the stream. Any piece of artillery (75mm or 105mm) can be floated across streams in this manner. Larger brush rafts are necessary for larger and heavier weapons.



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Figure 15.—37mm gun floated on three brush rafts.

9. Floating the $\frac{1}{4}$ Ton Truck with Brush Rafts.—Build four brush rafts, using the canvas cover of either the $\frac{1}{2}$ ton or the $\frac{3}{4}$ ton truck for each raft. To prepare the truck for the crossing, lash a pole about sixteen feet long to each bumper. Spot two brush rafts in the water so the truck can be driven in between them. Rest the front pole in the center of the two brush rafts, and continue to drive the truck into the stream until there is room to place the remaining two rafts beneath the ends of the rear pole. Attach a towing line to the front of the truck and a holdback line to the rear. The truck is ready to be taken across the stream. It is not necessary to lash the poles to the brush rafts as the weight of the vehicle will hold them in place. (See figure 16).



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Figure 16.— $\frac{1}{4}$ -ton truck floated on 4 brush rafts.

SECTION 4

FOOTBRIDGES

10. **General.**—Footbridges are one means of crossing for personnel who are carrying their normal tactical equipment. This is a quick method, and a well-constructed bridge is very reliable. Any material which will support the weight of a Marine in the water can be converted into some type of footbridge. When training troops in the preparation of bridges as expedients, instruction should not be limited to those given here; originality should be encouraged in an attempt to devise other types of bridges.

11. **Brush Raft Footbridge.**—a. Construct sufficient brush rafts of $\frac{3}{4}$ ton truck covers so that there is one brush raft for each 10 feet of stream to be crossed. Prepare flooring sections by preparing poles about six inches in diameter and eleven feet long. Nail to the poles a flooring of two foot long saplings or any other available material, leaving an extension of six inches at each end of the poles. Sufficient flooring should be prepared to completely span the stream. (See figure 17).

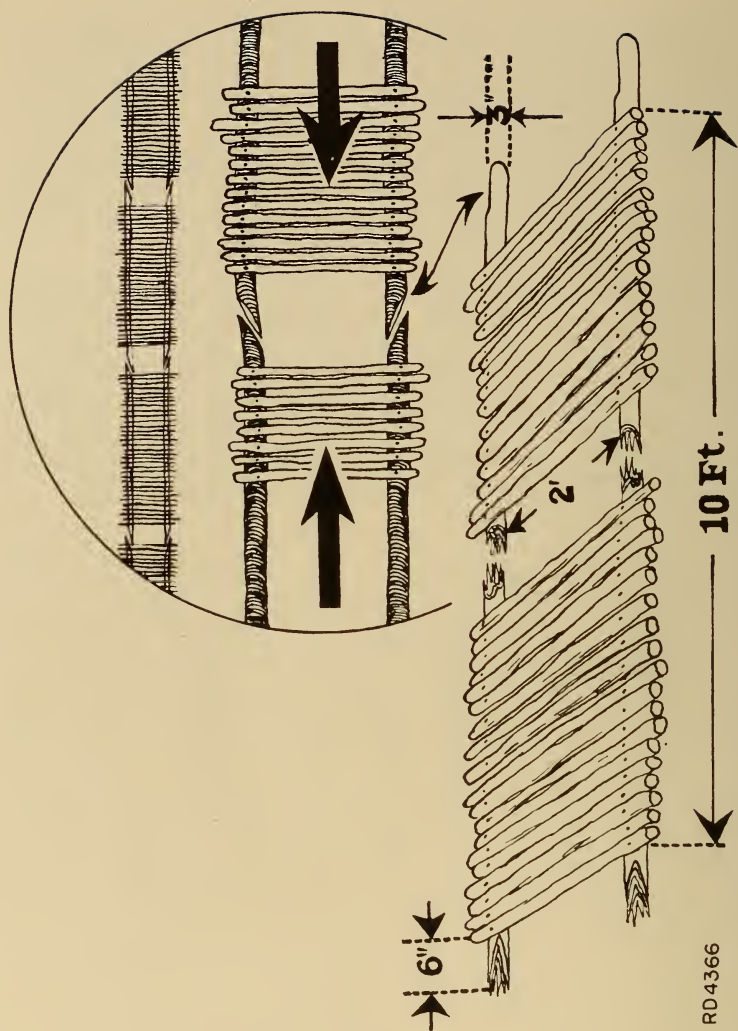


Figure 17.—Sections of footbridge showing fittings and dimensions.

b. The bridge is held in place against the current by a line stretched across the stream from a tree or other anchorage to an anchorage on the other bank. Place this line about five feet upstream from the site selected for the footbridge. After the line is in place, float the brush rafts into position just off shore below it. Tie one end of a 12 foot piece of line to each raft. Pass this line over the cable and bring it back to the raft. Station a man on each raft as it is placed in position. This man adjusts the alignment of the raft by means of the lashing. One flooring section is placed on the first raft and it is poled across the stream to the opposite bank. This section of flooring extends from the first raft to the far bank. In the meantime a second raft with a flooring section aboard is poled across the stream and this section of flooring is extended to the first raft that went across. The two sections are then interlocked (See figure 17) and lashed together. The rest of the brush raft footbridge is constructed in a similar manner with succeeding brush rafts, with a flooring section, poled across and the sections of bridge securely interlocked. (See figure 18).



Figure 18.—Brush raft footbridge.

c. When the bridge has reached the far bank, use the extra flooring section placed on the first two rafts to complete the connection to the far bank. The man on the brush rafts adjusts the lashings until the bridge is properly alined, and then uses the free end of the lashing to tie the flooring sections firmly together.

d. When used at night, this bridge will require a handrail. A number of types of handrails can be improvised. One satisfactory method is to stretch another line along the edge of the flooring, to guide Marines across the bridge. (See figure 19).

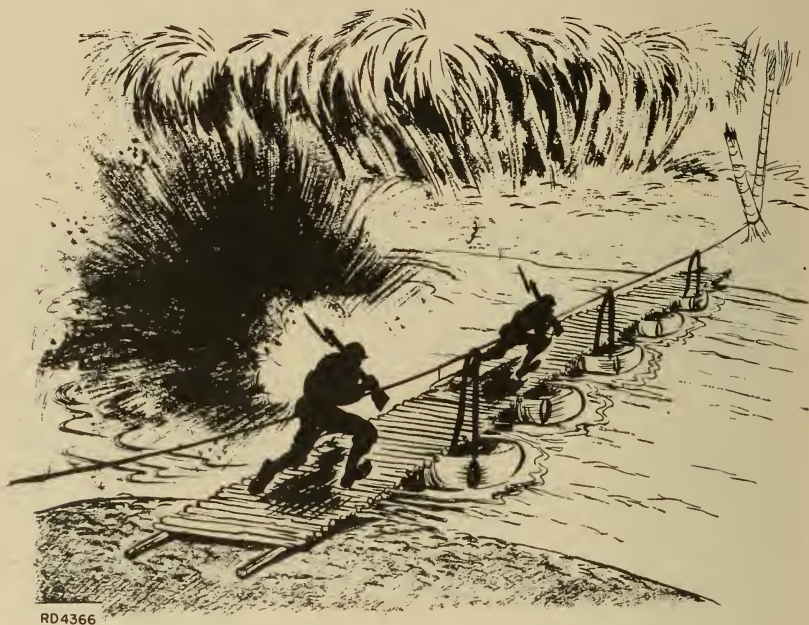


Figure 19.—Completed brushraft footbridge in use.

e. Satisfactory floatation for footbridges can also be obtained by using a combination of 55 gallon gas drums. Five gallon water or gasoline cans, used in large numbers, will provide sufficient floatation for an improvised footbridge. Care must be taken in any improvised bridge to make the flooring as rigid as possible. Too much spring in the flooring of a footbridge will make it almost impossible for soldiers to run across the bridge.

